

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Original) A power line communication (PLC) system for use with an electrical distribution network having one or more power line conductors, comprising:
 - a backhaul device;
 - a first repeater in communication with said backhaul device via one or more power line conductors;
 - a second repeater;
 - a first PLC device in communication with said second repeater via one or more power line conductors, and
wherein said first repeater is communicatively coupled to said second repeater via a communication link that forms part of a data path between said backhaul device and said first PLC device.
2. (Original) The system of claim 1, wherein said communication link comprises a wireless communication link.
3. (Original) The system of claim 1, wherein said communication link comprises a fiber optic link.
4. (Original) The system of claim 1, wherein said communication link comprises a coaxial cable communication link.
5. (Original) The system of claim 1, wherein said second repeater is configured to provide communications to a customer premises.

6. (Original) The system of claim 5, wherein said second repeater communicatively coupled to a user device in the customer premises via a power line.

7. (Original) The system of claim 1, wherein said backhaul device comprises a wireless transceiver.

8. (Original) The system of claim 1, wherein said first repeater is configured to provide communications to a customer premises.

9. (Original) The system of claim 1, wherein said communication link comprises a power line communication link.

10. (Original) The system of claim 9, wherein said power line communication link communicates data signals that are not intelligible by said first PLC device.

11. (Original) The system of claim 10, wherein said power line communication link communicates data signals that are not intelligible by said backhaul device.

12. (Original) The system of claim 9, wherein said backhaul device and said first PLC device cannot decrypt data signals communicated via said power line communication link.

13. (Original) The system of claim 9, wherein said first repeater communicates with said second repeater using a modulation scheme that is different than a modulation scheme used for communications between said backhaul device and said first repeater.

14. (Original) The system of claim 13, wherein said first repeater communicates with said second repeater using a modulation scheme that is different

than a modulation scheme used for communications between said first PLC device and said second repeater.

15. (Original) The system of claim 9, wherein said first repeater communicates with said second repeater using an encryption key that is not used by said backhaul device or said first PLC device.

16. (Original) The system of claim 9, wherein said first repeater communicates with said second repeater using at least one carrier frequency not used by said backhaul device and said first PLC device to communicate over the one or more power line conductors.

17. (Original) The system of claim 1, wherein said power line communication link communicates data signals that are not intelligible by said backhaul device.

18. (Original) The system of claim 1, wherein:
said first repeater is in communication with said backhaul device through a first power line conductor; and

 said first PLC device is in communication with said second repeater via a second power line conductor that is different from the first power line conductor.

19. (Original) The system of claim 18, wherein the first conductor and the second conductor are different phases of the same multi-phase power line.

20. (Original) The system of claim 1, wherein said backhaul device and said first repeater comprise a first group;
and said second repeater and said first PLC device comprise a second group.

21. (Original) The system of claim 20, wherein said first group and said second group are communicatively isolated except for said communication link.

22. (Original) The system of claim 20, wherein said first group further comprises a plurality of PLC devices in communication with said backhaul device via one or more power line conductors.

23. (Original) The system of claim 22, wherein each of said plurality of PLC devices is communicatively coupled to a different user device via a low voltage power line.

24. (Original) The system of claim 1, wherein said backhaul device forms part of a data path between said first PLC device and the Internet.

25. (Original) The system of claim 20, wherein said second group is further comprised of a transformer bypass device and said transformer bypass device provides communications to a customer premises.

26. (Original) The system of claim 1, wherein said backhaul device is configured to perform media access control (MAC) processing.

27. (Original) A system for providing communications over power lines, comprising:

a backhaul device;

a first repeater;

a second repeater;

a PLC device;

a first communication link communicatively coupling said backhaul device and said first repeater and comprised of a first power line data path;

a second communication link communicatively coupling said first repeater and said second repeater; and

a third communication link communicatively coupling said second repeater and said PLC device comprised of a second power line data path.

28. (Original) The system of claim 27, wherein said first power line data path comprises one or more power line conductors.

29. (Original) The system of claim 28, wherein said second communication link comprises a wireless link.

30. (Original) The system of claim 27, further comprising a fourth communication link communicatively coupling said backhaul device to the Internet.

31. (Original) The system of claim 30, wherein said fourth communication link comprises a point of presence.

32. (Original) The system of claim 30, wherein said fourth communication link comprises a wireless link.

33. (Original) The system of claim 27, wherein said second communication link comprises a wireless link.

34. (Original) The system of claim 27, wherein:
said first repeater is in communication with said backhaul device through a first power line conductor; and

said PLC device is in communication with said second repeater via a second power line conductor that is different from the first power line conductor.

35. (Original) A system for providing communications over power lines, comprising:

a first group comprising a plurality of PLC devices;
a first repeater communicatively coupled to at least one of said plurality of PLC devices of said first group;
a second PLC device;
a second repeater communicatively coupled to said second PLC device;
wherein said second repeater is in communication with said first repeater via a communication link; and
wherein said first group is communicatively isolated from said second PLC device.

36. (Original) The system of claim 35, wherein said communication link is comprised of a wireless link.

37. (Original) A system for providing communications over power lines, comprising:

a first group comprising a first plurality of PLC devices;
a first repeater communicatively coupled to at least one of said PLC devices of said first group;
a second group comprising a second plurality of PLC devices;
a second repeater communicatively coupled to at least one of said PLC devices of said second group;
wherein said second repeater is in communication with said first repeater via a communication link; and
wherein data signals transmitted from said second group are not intelligible by said PLC devices of said first group.

38. (Original) The system of claim 37, wherein said data signals transmitted from said second group are not intelligible, based in part, because they are not received by said PLC devices of said first group.

39. (Original) The system of claim 37, wherein said data signals transmitted from said second group are not decrypted by said PLC devices of said first group.

40. (Original) The system of claim 37, wherein said data signals transmitted from said second group are not demodulated by said PLC devices of said first group.

41. (Original) The system of claim 37, wherein said plurality of PLC devices of said first group comprises a backhaul device.

42. (Original) The system of claim 41, wherein said plurality of PLC devices of said first group comprises a PLC device communicatively coupled to a user device via a low voltage power line.

43. (Original) The system of claim 41, wherein said plurality of PLC devices of said first group comprises a PLC device communicatively coupled to a user device via a wireless communication link.

44. (Original) The system of claim 41, wherein said backhaul device comprises a wireless transceiver.

45. (Original) The system of claim 41, wherein said backhaul device comprises a fiber optic transceiver.

46. (Original) A power line communication system employing one or more power line conductors, comprising:

a backhaul device comprising a backhaul wireless transceiver and a first modem, wherein said first modem is in communication with said backhaul wireless transceiver and communicatively coupled at least one of the power line conductors;

a plurality of power line communication (PLC) devices, each comprising a PLC transceiver and a first PLC modem, wherein said first PLC modem is in communication with said PLC transceiver and communicatively coupled to one of the power line conductors, and

wherein said PLC modem is in communication with said first modem of said backhaul device via the one or more power line conductors.

47. (Original) The system of claim 46, wherein at least a portion of said plurality of PLC devices provide a data path bypassing a transformer.

48. (Original) The system of claim 47, wherein at least one of said plurality of PLC devices comprises a repeater.

49. (Original) The system of claim 46, wherein said backhaul device forms part of a data path between said plurality of PLC devices and the Internet.

50. (Original) The system of claim 46, wherein said backhaul device is configured to perform media access control (MAC) processing.

51. (Original) The system of claim 50, wherein said MAC processing comprises inserting a MAC address corresponding to one of said PLC devices into a data packet.

52. (Original) The system of claim 46, wherein said backhaul device is configured to perform media access control processing of at least a portion of the data transmitted from said plurality of PLC devices.

53. (Original) The system of claim 46, wherein said backhaul device further comprises a router in communication with said first modem and said backhaul wireless transceiver.

54. (Original) The system of claim 46, wherein said backhaul device further comprises a second modem communicatively coupled to a low voltage power line.

55. (Original) The system of claim 46, wherein said backhaul device further comprises a power supply receiving power from a low voltage power line.

56. (Original) The system of claim 46, wherein said plurality of PLC devices each further comprises a power supply receiving power from a low voltage power line.

57. (Original) The system of claim 46, wherein said PLC transceiver of at least a portion of said plurality of PLC devices is comprised of a second PLC modem communicatively coupled to a low voltage power line.

58. (Original) The system of claim 46, wherein said PLC transceiver of at least a portion of said plurality of PLC devices is comprised of a wireless PLC transceiver in communication with a user device.

59. (Original) The system of claim 58, wherein said wireless PLC transceiver is in communication with a plurality of user devices.

60. (Original) The system of claim 46, wherein said first modem of said backhaul device and said PLC modem of a portion of said PLC device are communicatively coupled to the same power line conductor.

61. (Original) The system of claim 46, wherein said first modem of said backhaul device and said PLC modem of a portion of said PLC devices are communicatively coupled to different power line conductors.

62. (Original) A method of providing power line communications over a power line, comprising:

at a first PLC device:

receiving first data transmitted from a first user device;

transmitting said first data over the power line;

at a backhaul device:

receiving said first data from the power line; and

wirelessly transmitting said first data.

63. (Original) The method of claim 62, further comprising:

at a second PLC device:

receiving second data transmitted from a second user device;

transmitting said second data over the power line;

at the backhaul device:

receiving said second data from the power line; and

wirelessly transmitting said second data.

64. (Original) The method of claim 62, further comprising:

at the first PLC device:

receiving second data from a second user device;

prioritizing said first data and said second data;

transmitting said second data over the power line; and

wherein said transmitting said first data and transmitting said second data are based on said prioritizing of said first data and said second data.

65. (Original) The method of claim 64, further comprising:
at the backhaul device:

receiving said second data from the power line; and
wirelessly transmitting said second data.

66. (Original) The method of claim 62, wherein the first data is transmitted over the power line by the first PLC device using orthogonal division multiplexing.

67. (Original) The method of claim 62, further comprising:
at the backhaul device:

wirelessly receiving second data;
transmitting said second data over the power line;

at the first PLC device:
receiving said second data from the power line; and
transmitting said second data to the first user device.

68. (Original) The method of claim 67, wherein the second data is transmitted to the first user device by the first PLC device by transmitting the second data over a low voltage power line.

69. (Original) The method of claim 62, wherein the first data is received at the first PLC device from the first user device via a low voltage power line.

70. (Original) The method of claim 62, wherein the first data comprises voice data.

71. (Original) The method of claim 67, wherein the second data comprises Internet data.

72. (Original) The method of claim 62, wherein the first data comprises video data.

73. (Original) The method of claim 64, wherein the first data and the second data comprise voice data.